

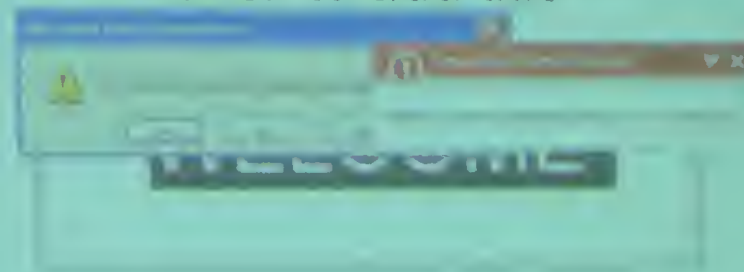








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- LONG TERM OVERHEATING
- • Little to moderate bulging
- • Little to moderate reduction in wall thickness
- • Typically accompanied by thermal oxidation
- • Found in superheaters, reheaters, waste



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Causes of high temperature creep
Restriction of the tube's coolant flow
internally by scale, debris, or condensate
Reduction of heat transfer capability due to
internal (steam-side) surface oxide scales
- chemical deposits
- Periodic Over firing or uneven firing of
burners
- Blockage of boiler gas passages
- Operation of a tube material at
temperatures higher than allowable
- increases in stress due to wall thinning











Water-Side Corrosion

- Caustic Corrosion

Hydrogen Damage

- Pitting (Localized Corrosion)



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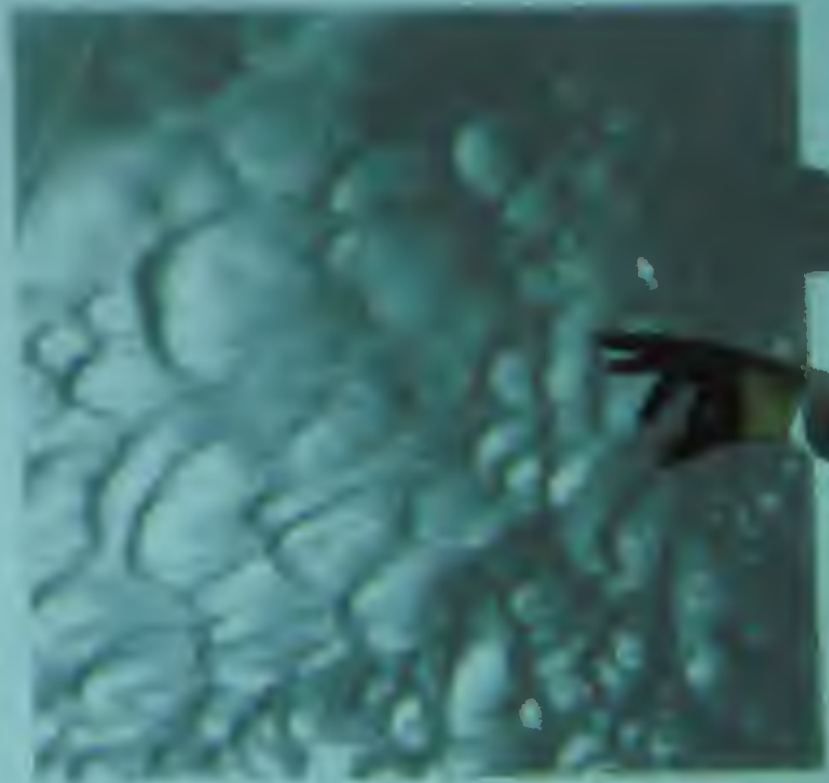






FLOW ASSISTED CORROSION

- *FAC affected by:*
 - Temperature
 - pH
 - O₂ concentration
 - Mass flow rate
 - Geometry
 - Quality of fluid
 - Alloys of construction























Exhaust Tube Failure,
Prevention and Control

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Longitudinal section

Central Tissue

Epidermis and endodermis

Phloem and Xylem

Ground tissue

Figure 1



Causes of high temperature creep

- Restriction of the tube's coolant flow internally by scale, debris, or condensate
- Reduction of heat transfer capability due to internal (steam-side) surface oxide scales or chemical deposits
- Periodic Over firing or uneven firing of fuel burners
- Blockage of boiler gas passages
- Operation of a tube material at temperatures higher than allowable
- Increases in stress due to wall thinning



Power plant Dictionary

SUNDARA VEER RAJU

MECWEL(INDIA)OMT





BOILER TUBE ANALYSIS

**BY
S.V. RAJU**

A TRAINING PROGRAM BY MECWEL(INDIA)

ASSALAYA SUDAN



BOILER TUBE FAILURE, PREVENTION AND CONTROL

Vijay Raju Sundara . 09/04/2008

A TRAINING PROGRAM OF
MECWEL(INDIA) O.M.T
at
SUDAN SUGAR COMPANY
Assalaya
SUDAN

Introduction

The content of this short presentation is to give you the ability to:

- Explain **four reasons** why large number of boiler tube failures. i.e. same failure mechanism, same root-cause, same tube, etc., occur in boilers
- Describe the **six requirements** for a formalized boiler tube failure prevention program
- Discuss **twenty-two common tube failure mechanisms** in terms of typical locations, appearances; root causes corrective action, etc

Definition: A boiler tube is considered to have a failure when its pressure boundary is broken by a leak or rupture, or prone to be broken due to wall thinning before the next scheduled boiler inspection.











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